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PURPOSE

The Open Leach Reactor (OLR) is a publicly disclosed, non-toxic, modular gold and silver recovery system designed for hobbyist and educational use. The core innovation relies on UV-C light and ozone to accelerate metal dissolution using household-safe ingredients: acetic acid and sodium chloride. This method avoids cyanide, hydrochloric acid, and hydrogen peroxide, while offering scalability, portability, and solar or battery operation.

SYSTEM OVERVIEW

Solution Components:

- **Acetic Acid** (5% vinegar reduced to 20–25%)
- **Sodium Chloride** (Pure NaCl, non-iodized)
- **Roasted material**: -200 mesh ore or e-waste (e.g., CPUs, RAM, jewelry scrap)
- **Ozone**: Supplied via air bubbler (required)

Light Source:

- UV-C LEDs or bulb, \~265nm wavelength (submersible or dry chambered)

Reactor Design:

- Acid-safe container (HDPE, borosilicate, or glass)
- UV-C source encased in sealed quartz window chamber or glass tube
- Ozone bubbler diffuser at base
- Mandatory gas scrubber (activated carbon or KOH trap)
- Optional magnetic or manual stirrer
- Battery, AC, or renewable power options

STEP-BY-STEP METHOD

1. **Prepare leaching solution**

2. Reduce vinegar (5% acetic acid) via cold distillation or low-heat evaporation to \~25%.

3. Add pure salt until saturated.

4. **Load reactor**

5. Place -200 mesh roasted material in acid-safe container.
6. Fill with vinegar + salt solution.
7. **Install UV-C source**
8. Ensure the UV-C bulb or LED array is sealed and isolated from liquid.
9. Position the light to maximize exposure.
10. **Begin ozone injection**
11. Turn on ozone generator.
12. Bubble ozone directly into solution through diffuser.
13. **Start UV-C lighting**
14. Power on LEDs or bulb.
15. Run system for 30 min to 2 hrs depending on material.
16. **Gas safety**
17. Ensure all exhaust passes through gas scrubber.
18. Do not inhale vapors. Operate in ventilated area.
19. **Recovery**
20. After reaction, filter solution.
21. Precipitate metals using preferred method (e.g., SMB for gold, copper for silver).

VARIANTS & OPTIONS

- **Vinegar strength**: 25–60% acetic acid (stronger = faster)
- **Power source**: AC, battery, solar, wind
- **Scrubber designs**: Carbon cartridge, liquid trap, KOH chamber
- **UV types**: Quartz tube lamp, 265nm LED 3535 chips
- **Scaling**: Use 1 tube (12 LEDs) for small batch; 25 tubes for 2x2 ft tank

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APPLICATIONS

- Gold and silver extraction from ore
- Recovery of Au, Ag, Pd, Cu from e-waste
- Portable recovery units for educational use
- Safe alternatives to cyanide leaching

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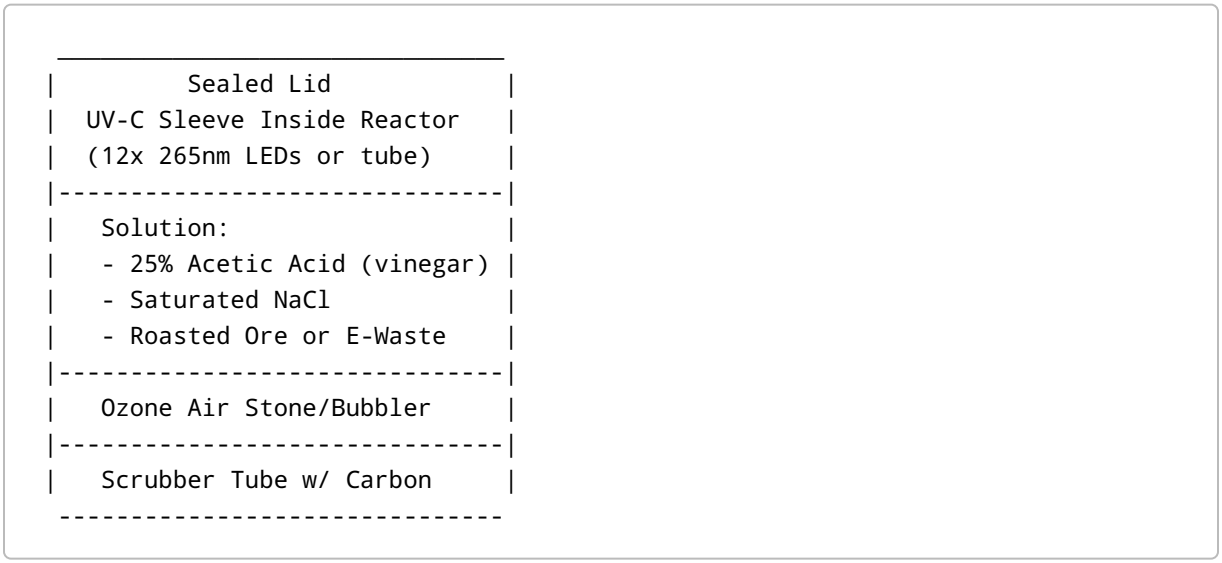
ASCII BLUEPRINT (Top View)



CONTACT

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